



Bay Energy Services

Smiley/Kopka Residence

Description

This is a 1600 sq. ft. home and 800 sq.ft. office building complex that is one of the longest running (over 10 years) "off grid" buildings in Michigan. Construction of the home began in 1985 and has been built in phases. The separate office building was constructed in 1998. The home and office are entirely powered with a WPT 3 kW windmill and 300 watts of solar PV. Other features include passive solar features in the home, solar landscaping and solar day lighting features.



Specifications

Passive Solar Features

- 160 sq. ft. of south facing glass
- Tree shading for summer cooling
- South roof soffit provides additional summer shading for cooling
- Two Sun Tubes light pipes provide natural daylight to the home

Solar Hot Water

- 64 sq. ft. of collector area
- Thermo-dynamics "solar boiler"
- 20 w PV powered circulation system
- 100 gallon hot water storage

Solar & Wind Power

- 1,100 watts photovoltaic 24 vdc
- 3,000 watt 24vdc, Whisper 175 (now SW Windpower model: Whisper 500) on 87 ft. (26 m) tower with green/blue/white (trees/sky/cloud) paint
- Grid intertied, but are interconnected less than 1% of time
- 35 kW-hr battery storage w/ 16, 370 amp-hr 6v deep cycle lead acid batteries
- Trace dc/ac Inverter: model 4024: 4,000 watts nominal



Space Heating

- Wood stove 50%, LP gas boiler 50%
- Planning on 100% biomass heating with a wood boiler

Energy Savings

The average monthly kw-hrs is 116 kW-hr/month. This is approximately 24% of what an average home uses. Average monthly energy use in the region is approximately 480 kw-hrs for the urban regions and 600 kw-hrs for the rural regions (data obtained from the local utilities). This low energy use is attributed to the use of energy efficient appliances, efficient lighting, use of natural daylight, utilizing hot water heat and efficient operation of the energy using equipment in the home and office.

For further information pertaining to this particular Energy Project contact:

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